Patent Claims

1. Pigment with at least one surface area whose smallest measurement is at least a multiple of the largest wave length (approximately 400 nm) of ultraviolet light, whereby the pigment presents a defined diffractive structure on at least one surface area, which is at least a multiple of the largest wave length (approximately 400 nm) of ultraviolet light, characterized in that the pigment exhibits an inner diffractive structure which is surrounded by an epitaxially applied sealant material.

2. Pigment according to Claim 1 characterized in that the smallest measurement of the surface area is at least a multiple of the largest wave length (approximately 8OO nm) of visible light and that the pigment on the least surface area presents at least one defined diffractive structure that has a spatial periodicity with one spatial period that is at least a multiple of the largest wave length (approximately 8OO nm) of visible light.

3. Pigment according to Claim 1 or 2 characterized in that it has a platelet-like shape, of which at east one surface area is the entire surface area on one of the sides of the platelet.

4. Pigment according to one of the claims from 1 to 3 characterized in that it presents a periodic diffractive structure extending over the entire pigment with a defined spatial frequency and spatial alignment.

5. Pigment according to one of the claims from 1 to 3 characterized in that it presents various areas with, in each case, divergent periodic diffractive structure.

6. Pigment according to Claim 5 characterized in that the different areas with a divergent periodic diffractive structure in each case differ in the spatial frequency and/or spatial alignment of the periodic structure of the prevailing area.

7. Pigment according to one of the claims from 1 to 6 characterized in that it presents a diffractive structure for ultraviolet light and a diffractive structure for visible light.

8. Pigment according to one of the claims from 1 to 7 characterized in that it presents a rotation-symmetrical diffraction gating with a cluster of concentrically circular diffraction lines.

9. Pigment according to one of the claims from 1 to 7 characterized in that it presents a star-shaped or polygonal diffraction grating with a cluster of concentrically polygonal diffraction lines.

10. Pigment according to one of the claims from 1 to 7 characterized in that it presents a periodical diffractive structure stretching itself over the entire pigment, which is an overlay of differently determined spatial frequencies and spatial alignments.

11. Pigment according to Claim 10 characterized in that it is a cutout from a hologram.

12. Pigment according to one of the claims from 1 to 11 characterized in that it consists of optically permeable material, whereby the defined diffractive structure is conferred by a defined spatial allocation of the pigment thickness and/or the refraction index of the pigment material.

13. Pigment according to one of the claims from 1 to 11 characterized in that it contains an optically permeable substance in the interior of which a reflective layer is arranged.

14. Pigment according to one of the claims from 1 to 11 characterized in that the defined diffractive structure is conferred by a defined spatial allocation of rises and depressions on a reflective surface layer of the pigment.

15. Pigment according to one of the claims from 1 to 14 characterized in that it presents an internal diffractive structure that is surrounded by an optically permeable sealant material.

16. Pigment according to one of the claims from 3 to 15 characterized in that its dimensions at the platelet level are in the range from between 5 μm and 200 μm and especially in the range between 10 μm and 30 μm.

17. Pigment according to Claim 16 characterized in that its thickness is in the range between 0.5 μm and 5 μm.

18. Pigment according to one of the claims from 1 to 17 characterized in that it is formed from at least two layers lying on top of each other.

19. Pigment according to one of the claims from 3 to 17 characterized in that it has a defined diffractive surface structure on both platelet levels.

20. Pigment according to one of the claims from 1 to 19 characterized in that the sealant consists of a hydrophobic substance.

21. Pigment according to one of the claims from 1 to 19 characterized in that the sealant consists of a hydrophobic substance.

22. Pigment according to one of the claims from 1 to 19 characterized in that the sealant on the first platelet level consists of a hydrophobic substance and on the second platelet level from a hydrophilic substance.

23. The procedure to produce pigments according to one of the claims from 1 to 22 entails the following steps:

    a) Stamping a defined diffractive structure into or onto a foil-like medium;

    b) Coating of the defined diffractive structure on the medium with a sealant substance by epitaxy;

    c) Pulverizing the foil-like medium produced in Steps (a) and (b) into pigment particles.

24. Procedure according to Claim 23 characterized in that Step (a) is carried out by hot stamping, Thixo stamping or reaction embossing.

25. Procedure according to Claim 23 characterized in that Step (a) is carried out by lithography, specifically by electron radiation or optical lithography.

26. Procedure according to Claim 23 characterized in that Step (a) is also carried out by scratching the surface of the medium.

27. Procedure according to Claims 23 through 26 characterized in that in Step (b), the diffractive structure is coated with a reflective layer.

28. Procedure according to Claims 23 through 27 characterized in that Step (b) is carried out by vapor or fluid deposition epitaxy.

29. Procedure according to Claims 23 through 27 characterized in that Step (b) is carried out by vaporizing, in particular, with metallic fumes.

30. Procedure according to Claims 23 through 27 characterized in that Step (c) also entails snipping the foil-like medium.

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31. Procedure according to Claims 23 through 29 characterized in that the foil-like medium employed in Step (a) presents a relatively elastic base layer as the initial layer onto which a relatively brittle second layer is introduced in and/or on which the defined diffractive structure is stamped and that Step (c) also entails trimming the foil-like medium.

32. Procedure according to Claims 23 through 31 characterized in that the sealant substance employed in Step (b) is a brittle, specifically lacquer-like or resin-like, material.

33. Procedure according to Claims 23 through 31 characterized in that the pulverization in Step (c) is carried out by wet pulverization.

34. Pigment powder, that presents pigments according to Claims 1 through 22 characterized in that they are produced according to the procedure in line with one of the claims from 23 to 33.

35. Pigment powder according to Claim 34 characterized in that the pigments are coated with an auxiliary agent.

36. Pigment powder according to Claim 35 characterized in that the auxiliary agent is a wetting agent.

37. Print color that contains a pigment powder produced in accordance with one of the claims from 34 to 36.

38. Lacquer that contains pigment powder produced in accordance with one of the claims from 34 to 36.

39. Transparent plastic, specifically PET, PEN, PBT, PA, PC, which contains a pigment powder produced in accordance with one of the claims from 34 to 36.

40. Document, which, for its authentication, presents one of the following characteristics:

- a printed imprint from print color as well as ink in accordance with Claim 37;

- a label made from transparent synthetic material in accordance with Claim 39.